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10/629,024	07/28/2003	Peter G. Webb	10003513-2	7639

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AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
P. O. Box 7599
Loveland, CO 80537-0599

EXAMINER

GROSS, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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1639

MAIL DATE	DELIVERY MODE
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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/629,024

Applicant(s)

WEBB, PETER G.

Examiner

CHRISTOPHER M. GROSS

Art Unit

1639

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 05 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17 and 19-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17, 19-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Responsive to communications entered 5/5/08 Claims 17,19-37 are pending. Claims 17,19-37 are under consideration.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Priority

This application is a DIV of application 09/628963, filed on 7/31/2000 (now PAT 6599693). Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 121 is once again acknowledged.

Withdrawn Objection(s) and/or Rejection(s)

The rejection of claims 17, 20-23, 25, 26, 28, 29-31, 33-34, 36,37 under 35 U.S.C. 102(a or e) as being anticipated by **Gamble et al** (US Patent 6001309) is hereby withdrawn in view of applicant's amendments to the claims.

The rejection of claims 17, 18, 20-23, 25, 26, 28, 29-31, 33-34 and 19 under 35 U.S.C. 103(a) as being unpatentable over **Gamble et al** (US Patent 6001309) in view of **Suovaniemi et al** (US Patent 4215092) is hereby withdrawn in view of applicant's amendments to the claims.

The rejection of claim 27 under 35 U.S.C. 103(a) as being unpatentable over **Gamble et al** (US Patent 6001309) in view of **Suovaniemi et al** (US Patent 4215092) as applied to claims 17,18,20-23, 25, 26, 28, 29-31, 33-34 and 19 above, and further in view of **Quinn et al** (US Patent 4685998) is hereby withdrawn in view of applicant's amendments to the claims.

Art Unit: 1635

The rejection of claims 17, 20-23, 25, 26, 28, 29-31, 33-34, 36,37 and 24,32,35 under 35 U.S.C. 103(a) as being unpatentable over **Gamble et al** (US Patent 6001309) in view of **Bass** (US Patent 6420180) is hereby withdrawn in view of applicant's amendments to the claims.

New Claim Rejection(s) – 35 USC § 103

Necessitated by Amendment

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17, 20-23, 25, 26, 28, 29-31, 33-34, 36,37 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Brown et al** (US Patent 5,807,522) in view of **Gamble et al** (US Patent 6001309).

The claimed subject matter per claim 17 is drawn to an apparatus for fabricating an array, comprising:

- (a) a head system with multiple pulse jet drop dispensers;
- (b) a transport system to move the head system with respect to a substrate;
- (c) a processor which controls the head and transport system so as to deposit at least a first feature set from a first dispenser onto a substrate and at least a second feature set from a second dispenser onto said substrate, so as to form an array with the multiple feature sets; wherein each of said multiple feature sets is made up of multiple features, and wherein a distance between at least two neighboring feature sets is greater than an average distance between features within said neighboring feature sets, both as measured in a same direction.

Claims 20-23, 25, 26, 28, 29-31, 33-34, 36,37 represent variations thereof

Brown et al teach, throughout the document especially the title and abstract methods for fabricating microarrays of biological samples with a capillary dispenser.

In particular, Brown et al teach in figures 5,9,10 and especially figure 6, preparation of an array with the multiple feature sets wherein each of said multiple feature sets is made up of multiple features, and wherein a distance between at least two neighboring feature sets is greater than an average distance between features within said neighboring feature sets, both as measured in a same direction, reading on claims 17c (in part) and 29 as well as a "a distance between at least two neighboring feature sets [being] greater than a greatest distance separating features within the sets, both distances as measured in a same direction" of claim 26 and finally "multiple feature sets, wherein each feature set is made up of multiple features," as set forth in claim 36.

Brown et al teach in figure 4, element 77 a processor which controls a head and transport system with respect to a substrate so as to deposit at least a first feature set from a first dispenser onto a substrate, reading on claims 17b, 17c (in part) and claim 17a (in part).

The photograph of the feature set according to Brown et al in figure 5 appears to have a distance between feature sets of less than 2 mm, in accordance with claim 28 and the features have the same spacing, such as set forth in claim 37.

Brown et al do not teach multiple pulse jet drop dispensers, as set forth in claim 17a or at least a second feature set from a second dispenser onto said substrate, as set forth in claims 17c and 29.

Gamble et al teach, throughout the document, and especially figures 6 and 10, column 13 line 28 and column 1 lines 33-39, an apparatus comprising jets formed in arrays, an x-y positioner and a master controller, all for fabricating arrays of arrays (multiple arrays) composed of microspots (features) comprising biological bloomers.

The jets formed in arrays of Gamble et al read on the 'head system with multiple pulse jet drop dispensers' of claim 17a as well as 'the different dispensers of the head system are moved in unison by the transport system' of claim 22.

Gamble et al teach in column 9, lines 15-18 that the groups of jets can provide a plurality of spots being formed simultaneously, concurrently or consecutively, in an interrupted manner, which provides at least a second feature set from a second dispenser onto said substrate of claim 17c and 29.

Said consecutive deposition of Gamble et al reads as capable of 'different dispensers deposit[ing] at least some of the drops of their respective drop sets on a same pass over the substrate' of claim 23.

In column 5, line 51, Gamble et al teach the apparatus is capable of depositing nucleotide monomers, which when combined with using the groups of jets in the consecutive manner, reads on the 'biomonomer containing drops is deposited from the same dispenser for each feature of the feature sets' of claim 21.

In column 9, lines 2-3, Gamble et al teach a jet sample reservoir holding 0.2 to 20 microliters, reading on 'each dispenser holding no more than 100 microliters' of claim 20.

In figure 7, Gamble et al teach an alternative embodiment in which 16 microspot features are deposited circumferentially, on a disk, which reads on a 'set of neighboring features includ[ing] at least four features in a non-linear configuration' of claim 25.

Gamble et al teach multiple arrays on a substrate in figures 6 and 7, as set forth in claim 36.

It would have been *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to apply the multiple pulse jet drop dispensers according to Gamble et al toward preparation of the microarrays in the configuration according to Brown et al. In column 4, first paragraph, Gamble et al teach that the entire system is controlled by a computer program, including x-y movement of the dispensers, droplet deposition, etc. Said computer program of Gamble et al provides all of the apparatus capabilities mentioned above and therefore provides the computer program per claims 29-31, 33-34 that controls the apparatus reflected in claims 17,20-23, 25, 26 and 28 discussed above.

One of ordinary skill in the art would have been motivated to use multiple pulse jet drop dispensers according to Gamble et al in preparing the microarrays in the configuration according to Brown et al because of the tremendous time savings in preparing the arrays in parallel (i.e. simultaneously or concurrently), as noted by Gamble et al in column 13, line 29-30.

One of ordinary skill in the art would have had a reasonable expectation of success in applying the multiple pulse jet drop dispensers according to Gamble et al toward the microarrays in the configuration according to Brown et al because both references concern microarray fabrication, thus the arrays of Brown et al lie well within the scope of technology according to Gamble et al.

Claim 24,32,35 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Brown et al** (US Patent 5,807,522) **in view of Gamble et al** (US Patent 6001309) as applied to claims 17, 20-23, 25, 26, 28, 29-31, 33-34, 36,37 above, and further in view of **Bass** (US Patent 6420180)

Brown et al in view of Gamble et al is relied on as above.

Brown in view of Gamble et al do not teach at least ten different dispensers (claims 24,32) or a pulse jet dispensers having a displacement error (claim 35).

Bass teaches, throughout the document and especially column 7 line 44 through column 8 lines 1-36 a manner of compensating for displacement errors. Bass further teach in figure 7 a head comprising more than ten dispensers.

It would have been *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to utilize the process of compensating for displacement errors comprising a head with more than ten dispensers of Bass in concert with the jet droplet device of Gamble et al for fabricating the microarrays according to Brown et al.

One of ordinary skill in the art would have been motivated to use the process of compensating for displacement errors comprising a head with more than ten dispensers of Bass in concert with the jet droplet device of Gamble et al for fabricating the microarrays according to Brown et al because it is desirable to provide a means by which serious errors would be reduced, as noted by Bass in column 3, lines 12-13, in order to generate higher quality microarrays.

One of ordinary skill in the art would have had a reasonable expectation of success in compensating for displacement errors comprising a head with more than ten dispensers per Bass in concert with the jet droplet device of Gamble et al for fabricating the microarrays according to Brown et al because both Bass and Gamble et al concern pulsejet mediated oligonucleotide synthesis directed toward the preparation of microarrays. Thus, the protocol and head of Bass lies well within the scope of the teaching(s) of both Gamble et al and Brown et al.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Brown et al** (US Patent 5,807,522) in view of **Gamble et al** (US Patent 6001309) as applied to claims 17, 20-23, 25, 26, 28, 29-31, 33-34, 36,37 above, and further in view of **Suovaniemi et al** (US Patent 4215092).

Brown et al in view of Gamble et al is relied on as above.

Whereas Gamble et al does teach a robotic pipette loading station for the jet dispensers comprising microtiter plates (figure 10, element 302), which is taken to be "a

loading station with receptacles to retain multiple different fluids" of claim 19, Neither Gamble et al or Brown et al teach the capability of loading the dispensers *simultaneously* with different fluids, as set forth in claim 19.

Suovaniemi et al teach, throughout the publication and especially figure 1, a multi-channel pipette which allows for simultaneous pipetting of different samples from different wells of a microtiter plate.

It would have been *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to include the multi-channel pipette of Suovaniemi et al as part of the apparatus of Gamble et al for fabricating the microarrays according to Brown et al.

One of ordinary skill in the art would have been motivated to use the multichannel pipette of Suovaniemi et al with the apparatus of Gamble et al for fabricating the microarrays according to Brown et al because it would have further improved throughput. In column 13, lines 50-65, Gamble et al note the tremendous time savings gained by spotting in parallel, as opposed to, in series. Loading the jet dispensers in parallel would have served to further reduce the time required to complete fabrication of an array: Gamble et al state in column 13, line 62-63 that further time reduction may be achieved by reduced jet exchange time.

One of ordinary skill in the art could have used the multi-channel pipette of Suovaniemi et al with the apparatus of Gamble et al for fabricating the microarrays according to Brown et al with a reasonable expectation of success since multi-channel

pipettes have been known in the art to streamline ELISAs and other assays for some time.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Brown et al** (US Patent 5,807,522) **in view of Gamble et al** (US Patent 6001309) as applied to claims 17, 20-23, 25, 26, 28, 29-31, 33-34, 36,37 above, and further in view of **Quinn et al** (US Patent 4685998).

The apparatus of claim 27 additionally comprises a substrate cutter, and wherein the processor causes multiple arrays to be fabricated on a same substrate, and additionally causes the cutter to separate the substrate into multiple segments each carrying at least one of the arrays.

Brown et al in view of Gamble et al is relied on as above.

Neither Gamble et al or Brown et al teach a cutter under computer control, however.

Quinn et al throughout the publication, and especially column 3, lines 8-11 and figure 1 teach a wafer (functionally equivalent to a large substrate) in which a saw and punch-out device is used to extract "dice" (a.k.a. chips).

It would have been prima facie obvious for one of ordinary skill in the art, at the time the claimed invention was made to add the wafer saw and punch-out device under computer control of Quinn et al to the apparatus of Gamble et al for fabricating the microarrays according to Brown et al.

One of ordinary skill in the art would have been motivated to make the apparatus of Gamble et al for fabricating the microarrays according to Brown et al and incorporate the wafer saw and punch-out device under computer control of Quinn et al because, the density and small size (micron scale) of the deposited features would have made excision by hand difficult without damaging the array.

One of ordinary skill in the art could have added to the wafer saw and punch-out device under computer control of Quinn et al to the apparatus of Gamble et al for fabricating the microarrays according to Brown et al with a reasonable expectation of success since computer controlled saws and punch-out devices have been used for integrated circuit (chip) manufacturing for some time.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 1635

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Gross whose telephone number is (571)272-4446. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. Douglas Schultz can be reached on 571 272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Christopher M Gross
Examiner
Art Unit 1639

cg

/JD Schultz, PhD/
Supervisory Patent Examiner, Art Unit 1635